The OnTech self-heating container is built from two main parts: the container and the actuating "puck." The container is composed of an inner cone that holds the mineral (Calcium Oxide), and the outer container body, which holds the beverage product. The puck holds water and is sealed by a foil membrane. All components are made from FDA-approved materials.

On to the dissection…

The container looks like there's a lot of liquid in it, but I later found out that it's actually a lot of heating material.

TO HEAT CONTAINER
Turn container UPSIDE DOWN before opening and follow instructions.
STEP 4
HOT SPOT turns from pink to white when beverage is hot. (6-8 minutes)
STEP 5
Once hot, shake 5 to 10 seconds then twist lid to align opening with pull-tab. Open and enjoy.
TWIST WHEN HOT
DO NOT WEIGHT OR FREEZE. FOR BEST RESULTS, STORE & ACTIVATE AT ROOM TEMPERATURE.

Simple instructions, pop the bottom, press it in. Watch for the pink spot to turn white.

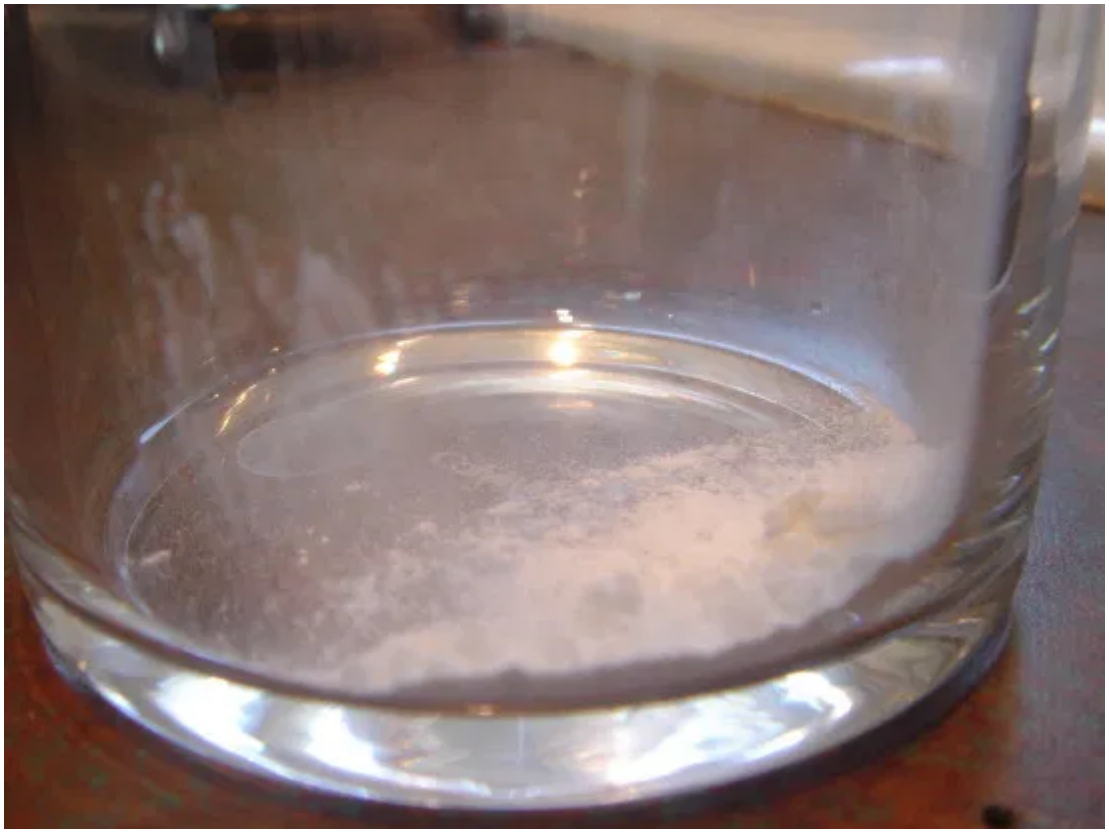
It worked fine, it was warm, took about 6 minutes and heated to about 140 degrees. I then used a can opener to pry to the top off.

Here’s the container without the fancy outside, I like this design better.

Here's the pressed in bottom. Once pressed the foil inside breaks and water drips down to the calcium oxide and starts the reaction.

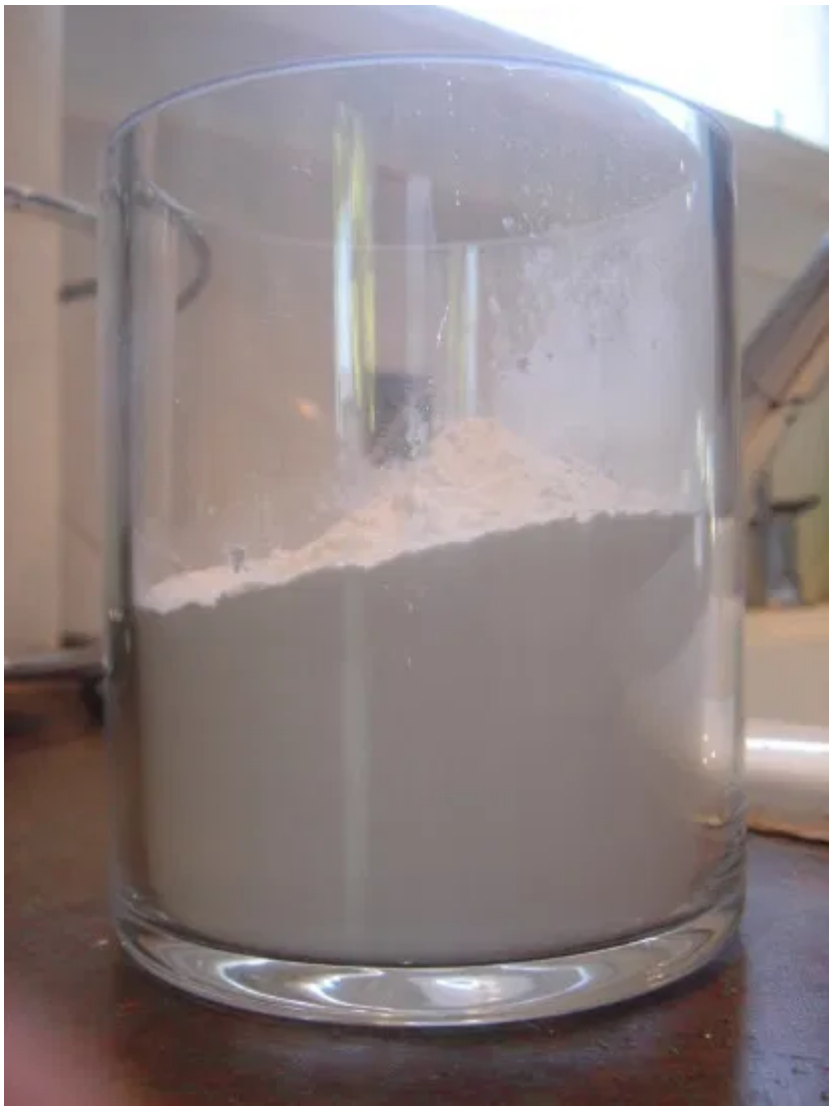
Here's the inner heating element, I sawed off the outside to reveal the inner chamber.

This thing is constructed of extremely heavy duty plastic, and it's quite dense. Which makes sense; it's filled with minerals.

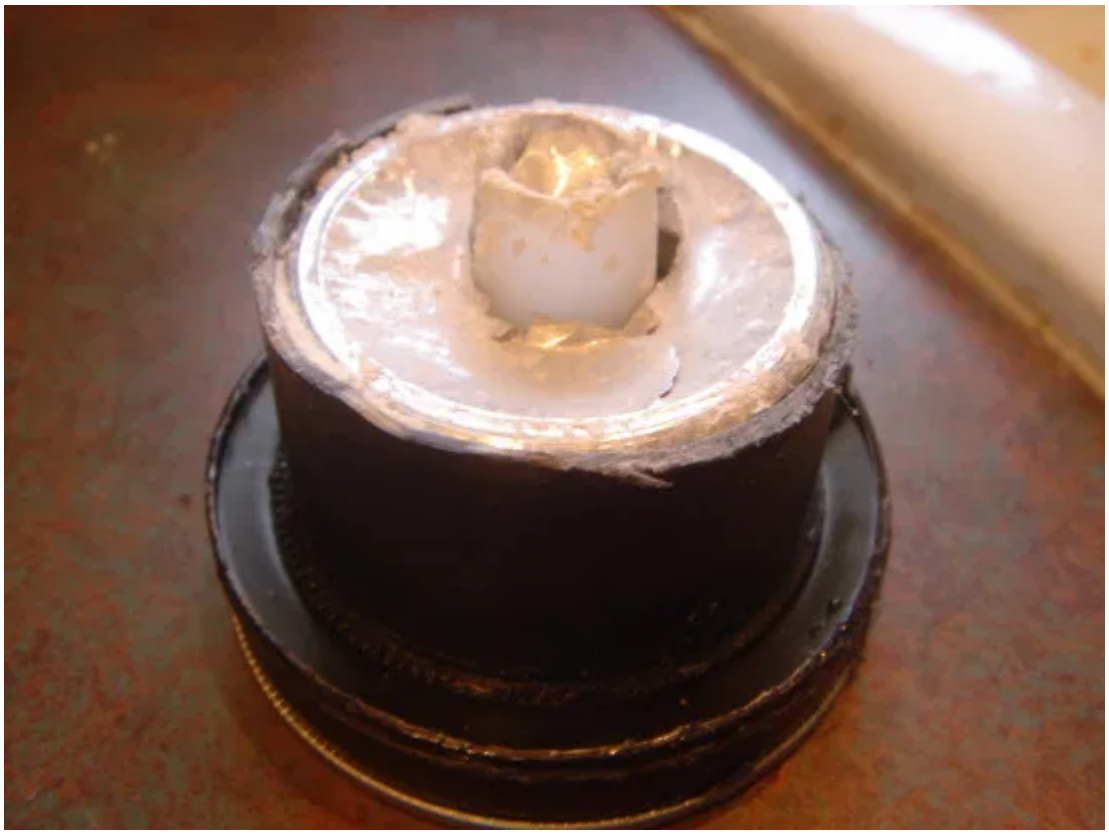


I chopped the top off and poured some of the powder / mineral in to a glass.

Then poured more out.



It fills about 8 ounces, it’s white and powdery, but contains little multi-colored rocks.



Here’s the water release system.

The inner ring presses through the foil.

The calcium oxide, dry.

The calcium oxide wet.

So there it is, an exothermic reaction (gives heat off) with water and calcium oxide. You can easily remove the liquid and use it for something else. I'm not sure what, but I think there are some uses for this. It's constructed like a tank, so I bet military and outdoors people might be using these.

One of the best uses might be to remove all the materials (before they're heated/water added) and show how chemical reactions can be used for something tangible for students. You could also likely do some neat things with the materials for experiments that require a small amount of heat.

The patents

On the bottom of the can there are two patent numbers, here's what the patents are for.

United States Patent 5,461,867

Scudder , et al. October 31, 1995

Container with integral module for heating or cooling the contents

Abstract

An outer container for holding a material, such as a food, beverage or medicine with a sealed thermic module inside the container. The thermic module contains chemical reactants that mix upon actuation of the container by a user. Mixing of the reactants produces an exothermic or endothermic chemical reaction, depending upon the reactants selected. The contents of the outer container surround a portion of the outside surface of the thermic module, thereby facilitating conduction of heat. The thermic module has a hollow module body that is closed at one end and a module cap that seals the other end of the module body. The module body contains the solid reactant, and the module cap contains the liquid reactant. The module cap has a tubular section with a flexible member closing one end and a breakable barrier closing the other end. With the exception of the barrier, the cap is of unitary construction. The cap has one or more integrally formed prongs extending from the inner surface of the disc toward the barrier. The prongs move in an axial direction toward the barrier and may also spread apart radially when the outer surface of the flexible member or an actuator connected to it is depressed by the user's finger. The dual motion of the prongs in both axial and radial directions promotes complete puncturing of the barrier and thus fast mixing of the reactants.

Link.

5,626,022

Scudder , et al. May 6, 1997

Container with integral module for heating or cooling the contents

Abstract

An container for holding a material, such as a food, beverage or medicine, includes a cap and a container body. The container body has a material cavity unitarily formed with a reactant cavity. The reactant cavity contains a solid reactant, and the cap contains a liquid reactant that, when mixed, produce an endothermic or exothermic reaction, depending upon the reactants selected. The cap has a tubular body section with an actuator disc closing one end and a breakable barrier closing the other end. With the exception of the barrier, the cap is of unitary construction. The cap has one or more prongs extending from the inner surface of the disc toward the barrier. When a user depresses the actuator disc, it

flexes inwardly and moves the prongs toward the barrier. The reactants mix when the prongs puncture the barrier. Heat transferred between the two cavities heats or cools the material. The wall of the container that defines the reactant cavity may be pleated or corrugated to promote heat transfer.

Link.

Click the link(s) to read more and to see the images. I'm somewhat fascinated by self-heating and cooling technologies and how they're going to be entering our food distributing and consumption in the next few years. I think these types of containers might change the vending machines with the types of beverages and foods they distribute, and of course there are also some recycling strategies for these new cans? Anyway, if you come up with any cool projects let me know. I have a couple I'll be posting up soon.